Statement of Volatility – Dell Precision T1650

⚠ **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

The Dell Precision T1650 contains both “volatile” and “non-volatile” (NV) components. Volatile components lose their data immediately upon removal of power from the component. Non-volatile components continue to retain their data even after the power has been removed from the component. The following volatile and NV components are present on the Dell Precision T1650 motherboard:

Description	**Reference Designator**	**Volatility Description**	**User Accessible for external data**	**Remedial Action** (action necessary to lose data)
Embedded Flash memory in embedded controller SMSC5545	U01	96K bytes non-volatile memory. 2K bytes non-volatile memory for keyboard controller.	No	N/A
System BIOS	SPI_1, SPI_2	Non-volatile memory, 64M bits (8MB), 32Mbits (4MB) System BIOS and Video BIOS for basic boot operation, PSA (on board diags.)	No	N/A
TPM	UF2	4K bytes non-volatile memory located in the TPM module.	No	N/A
System Memory – DDR3 DIMM memory	Connectors : DIMM1, DIMM2, DIMM3, DIMM4	Volatile memory in OFF state (see state definitions later in text) One to four modules will be populated. System memory size will depend on DIMM modules and will be between 1 GB to 8 GB.	Yes	Power off system.
System memory SPD EEPROM	On memory DIMM(s) – one, two, three, or four present	Non-volatile EEPROM memory. 2K bits (256 bytes). One Device present on each DIMM. Stores memory manufacturer data and timing information for correct operation of system memory.	No	N/A
RTC CMOS	BATTERY	Volatile battery back-backed CMOS memory 256 bytes. Stores CMOS information.	No	Removing the on board Coin Cell battery.

Description	Reference Designator	Volatility Description	User Accessible for external data	Remedial Action (action necessary to lose data)
Video memory – type – see next column	UMA architecture- uses system DDR3.	Volatile memory in off state. UMA uses main system memory size allocated out of main memory.	No	Enter S3-S5 state below.
Hard drive	User replaceable	Non-volatile magnetic media, various sizes in GB.	Yes	Low level format.
CD-ROM/RW/ DVD/ DVD+RW/ Diskette Drives	User replaceable	Non-volatile optical/magnetic media.	Yes	Low level format/erase.

All other components on the motherboard will lose data once power is removed from the system. Primary power loss (Unplug the power cord and remove the battery) will destroy all user data on the memory (DDR3, 1333/1600MHz). Secondary power loss (removing the on board coin-cell battery) will destroy system data on the system configuration and time-of-day information.

In addition, to clarify memory volatility and data retention in situations where the system is put in different ACPI power states the following is provided (those ACPI power states are S0, S1, S3, S4 and S5):

- S0 state is the working state where the dynamic RAM is maintained and is read/write by the processor.
- S1 state is a low wake-up latency sleeping state. In this state, no system context is lost (CPU or chip set) and hardware maintains all system contexts.
- S3 is called “suspend to RAM” state or stand-by mode. In this state the dynamic RAM is maintained. Dell systems will be able to go to S3 if the OS and the peripherals used in the system supports S3 state. Linux and Windows 7 support S3 state.
- S4 is called “suspend to disk” state or “hibernate” mode. There is no power. In this state, the dynamic RAM is not maintained. If the system has been commanded to enter S4, the OS will write the system context to a non-volatile storage file and leave appropriate context markers. When the system is coming back to the working state, a restore file from the non-volatile storage can occur. The restore file has to be valid. Dell systems will be able to go to S4 if the OS and the peripherals support S4 state. Windows 7 support S4 state.
- S5 is the “soft” off state. There is no power. The OS does not save any context to wake up the system. No data will remain in any component on the system board, i.e. cache or memory. The system will require a complete boot when awakened. Since S5 is the shut off state, coming out of S5 requires power on which clears all registers.

The following table shows all the states supported by Dell Precision T1650.

Model Number	S0	S1	S3	S4	S5
Dell Precision T1650	X		X	X	X